SPEC® CPU2017 Integer Speed Result

Dell Inc.
PowerEdge T140 (Intel Xeon E-2144G, 3.60GHz)

**SPECspeed2017_int_base** = 9.83
**SPECspeed2017_int_peak** = 9.76

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

<table>
<thead>
<tr>
<th>Software</th>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS: SUSE Linux Enterprise Server 12 SP3</td>
<td>CPU Name: Intel Xeon E-2144G</td>
</tr>
<tr>
<td>Compiler: C/C++: Version 18.0.2.20180210 of Intel C/C++ Compiler for Linux; Fortran: Version 18.0.2.20180210 of Intel Fortran Compiler for Linux</td>
<td>Max MHz.: 4500</td>
</tr>
<tr>
<td>Firmware: Version 1.0.1 released Oct-2018</td>
<td>Nominal: 3600</td>
</tr>
<tr>
<td>File System: xfs</td>
<td>Enabled: 4 cores, 1 chip, 2 threads/core</td>
</tr>
<tr>
<td>System State: Run level 3 (multi-user)</td>
<td>Orderable: 1 chip</td>
</tr>
<tr>
<td>Base Pointers: 64-bit</td>
<td>Cache L1: 32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Peak Pointers: 32/64-bit</td>
<td>L2: 256 KB I+D on chip per core</td>
</tr>
<tr>
<td>Other: jemalloc memory allocator v5.0.1</td>
<td>L3: 8 MB I+D on chip per chip</td>
</tr>
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---

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed2017_int_base (9.83)</th>
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<tbody>
<tr>
<td>600.perlbench_s</td>
<td>6.97</td>
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<tr>
<td>602.gcc_s</td>
<td>11.7</td>
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<td>605.mcf_s</td>
<td>14.6</td>
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<td>620.omnetpp_s</td>
<td>14.6</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>11.4</td>
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<tr>
<td>625.x264_s</td>
<td>13.2</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>15.3</td>
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<td>641.leela_s</td>
<td>13.7</td>
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<tr>
<td>648.exchange2_s</td>
<td>16.4</td>
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<tr>
<td>657.xz_s</td>
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<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed2017_int_peak (9.76)</th>
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<tr>
<td>600.perlbench_s</td>
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<td>620.omnetpp_s</td>
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<tr>
<td>623.xalancbmk_s</td>
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<tr>
<td>625.x264_s</td>
<td>15.3</td>
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<td>631.deepsjeng_s</td>
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<td>16.4</td>
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<td>12.7</td>
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Test Date: Dec-2018
Hardware Availability: Dec-2018
Software Availability: Apr-2018
Dell Inc.
PowerEdge T140 (Intel Xeon E-2144G, 3.60GHz)

 SPECspeed2017_int_base = 9.83
 SPECspeed2017_int_peak = 9.76

Results Table

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<tr>
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<tr>
<td>600.perlbeng_s</td>
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<td>12.7</td>
<td>487</td>
<td>12.7</td>
<td>486</td>
<td>12.7</td>
</tr>
</tbody>
</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

General Notes

Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-32:/home/cpu2017/je5.0.1-64"
OMP_STACKSIZE = "192M"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM memory using Redhat Enterprise Linux 7.4
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.
Transparent Huge Pages enabled by default
Prior to runcpu invocation
Filesystem page cache synced and cleared with:
 sync; echo 3> /proc/sys/vm/drop_caches
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**Tested by:** Dell Inc.  

**Test Date:** Dec-2018  
**Hardware Availability:** Dec-2018  
**Software Availability:** Apr-2018

---

**Platform Notes**

BIOS settings:  
Virtualization Technology disabled  
System Profile set to Custom  
CPU Performance set to Maximum Performance  
C States set to Autonomous  
C1E disabled  
Uncore Frequency set to Dynamic  
Energy Efficiency Policy set to Performance  
Memory Patrol Scrub disabled  
Logical Processor enabled  
CPU Interconnect Bus Link Power Management disabled  
PCI ASPM L1 Link Power Management disabled  
Sysinfo program /home/cpu2017/bin/sysinfo  
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9  
running on linux-gdas Wed Dec 19 13:11:33 2018

SUT (System Under Test) info as seen by some common utilities.  
For more information on this section, see  
https://www.spec.org/cpu2017/Docs/config.html#sysinfo

From /proc/cpuinfo
- model name : Intel(R) Xeon(R) E-2144G CPU @ 3.60GHz
- 1 "physical id"s (chips)
- 8 "processors"
  - cores, siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)
    - cpu cores : 4
    - siblings : 8
    - physical 0: cores 0 1 2 3

From lscpu:
- Architecture: x86_64  
- CPU op-mode(s): 32-bit, 64-bit  
- Byte Order: Little Endian  
- CPU(s): 8  
- On-line CPU(s) list: 0-7  
- Thread(s) per core: 2  
- Core(s) per socket: 4  
- Socket(s): 1  
- NUMA node(s): 1  
- Vendor ID: GenuineIntel  
- CPU family: 6  
- Model: 158  
- Model name: Intel(R) Xeon(R) E-2144G CPU @ 3.60GHz  
- Stepping: 10  
- CPU MHz: 4276.941  
- CPU max MHz: 4500.0000

(Continued on next page)
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Platform Notes (Continued)

CPU min MHz: 800.0000
BogoMIPS: 7199.98
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 256K
L3 cache: 8192K
NUMA node0 CPU(s): 0-7
Flags: fpu vme de pse tsc msr pae mca cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl apic sep mce cx8 apic cpuid cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl apic sep mce cx8 apic cpuid cmov

From /proc/cpuinfo cache data

/proc/cpuinfo cache data

cache size : 8192 KB

From numactl --hardware

 WARNING: a numactl 'node' might or might not correspond to a physical chip.

 available: 1 nodes (0)
 node 0 cpus: 0 1 2 3 4 5 6 7
 node 0 size: 64277 MB
 node 0 free: 62720 MB
 node distances:
 node 0
 0: 10

From /proc/meminfo

MemTotal: 65820248 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/usr/bin/lsb_release -d

SUSE Linux Enterprise Server 12 SP3

From /etc/*release* /etc/*version*

SuSE-release:

 SUSE Linux Enterprise Server 12 (x86_64)
 VERSION = 12
 PATCHLEVEL = 3

# This file is deprecated and will be removed in a future service pack or release.
# Please check /etc/os-release for details about this release.

os-release:

(Continued on next page)
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Platform Notes (Continued)

NAME="SLES"
VERSION="12-SP3"
VERSION_ID="12.3"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP3"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp3"

uname -a:
Linux linux-gdas 4.4.126-94.22-default #1 SMP Wed Apr 11 07:45:03 UTC 2018 (9649989)
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:
CVE-2017-5754 (Meltdown): Mitigation: PTI
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS+IBPB

run-level 3 Dec 19 13:11 last=5

SPEC is set to: /home/cpu2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 605G 16G 589G 3% /

Additional information from dmidecode follows. WARNING: Use caution when you interpret this section. The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.
BIOS Dell Inc. 1.0.1 10/19/2018
Memory:
3x 00AD00000A02 HMA82GU7CJR8N-VK 16 GB 2 rank 2666
1x 00AD00000A07 HMA82GU7CJR8N-VK 16 GB 2 rank 2666

(End of data from sysinfo program)

Compiler Version Notes

CC 600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base) 657.xz_s(base)

icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

(Continued on next page)
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PowerEdge T140 (Intel Xeon E-2144G, 3.60GHz)  

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**Compiler Version Notes (Continued)**

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<th>Compiler</th>
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**Base Compiler Invocation**

C benchmarks:
```
icc -m64 -std=c11
```

C++ benchmarks:
```
icpc -m64
```
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Base Compiler Invocation (Continued)

Fortran benchmarks:
ifort -m64

Base Portability Flags

600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-W1, -z, muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -gopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:
-W1, -z, muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

Fortran benchmarks:
-W1, -z, muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs
-L/usr/local/je5.0.1-64/lib -ljemalloc

Peak Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks (except as noted below):
icpc -m64

(Continued on next page)
Peak Compiler Invocation (Continued)

623.xalancbmk_s: icpc -m32 -L/home/prasadj/specdev/IC18u2_Internal/lin_18_0_20180210/compiler/lib/ia32_lin

Fortran benchmarks:
ifort -m64

Peak Portability Flags

600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -D_FILE_OFFSET_BITS=64 -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64

Peak Optimization Flags

C benchmarks:

600.perlbench_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2
-xCORE-AVX2 -qopt-prefetch -ipo -O3
-qopt-mem-layout-trans=3 -no-prec-div
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP
-fno-strict-overflow -L/usr/local/je5.0.1-64/lib
-ljemalloc

602.gcc_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2
-xCORE-AVX2 -qopt-prefetch -ipo -O3
-qopt-mem-layout-trans=3 -no-prec-div
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

605.mcf_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -O3 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc

625.x264_s: Same as 602.gcc_s

(Continued on next page)
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Peak Optimization Flags (Continued)

657.xz_s: Same as 602.gcc_s

C++ benchmarks:
620.omnetpp_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -O3 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc

623.xalancbmk_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -O3 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -L/usr/local/je5.0.1-32/lib -ljemalloc

631.deepsjeng_s: Same as 620.omnetpp_s
641.leela_s: Same as 620.omnetpp_s

Fortran benchmarks:
-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2)
-DSPEC_SUPPRESS_OPENMP -DSPEC_OPENMP -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -qopt-mem-layout-trans=3 -qopenmp
-nostandard-realloc-lhs -L/usr/local/je5.0.1-64/lib -ljemalloc

The flags files that were used to format this result can be browsed at

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.xml

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU2017 v1.0.5 on 2018-12-19 14:11:32-0500.
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